



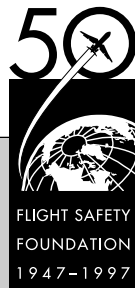
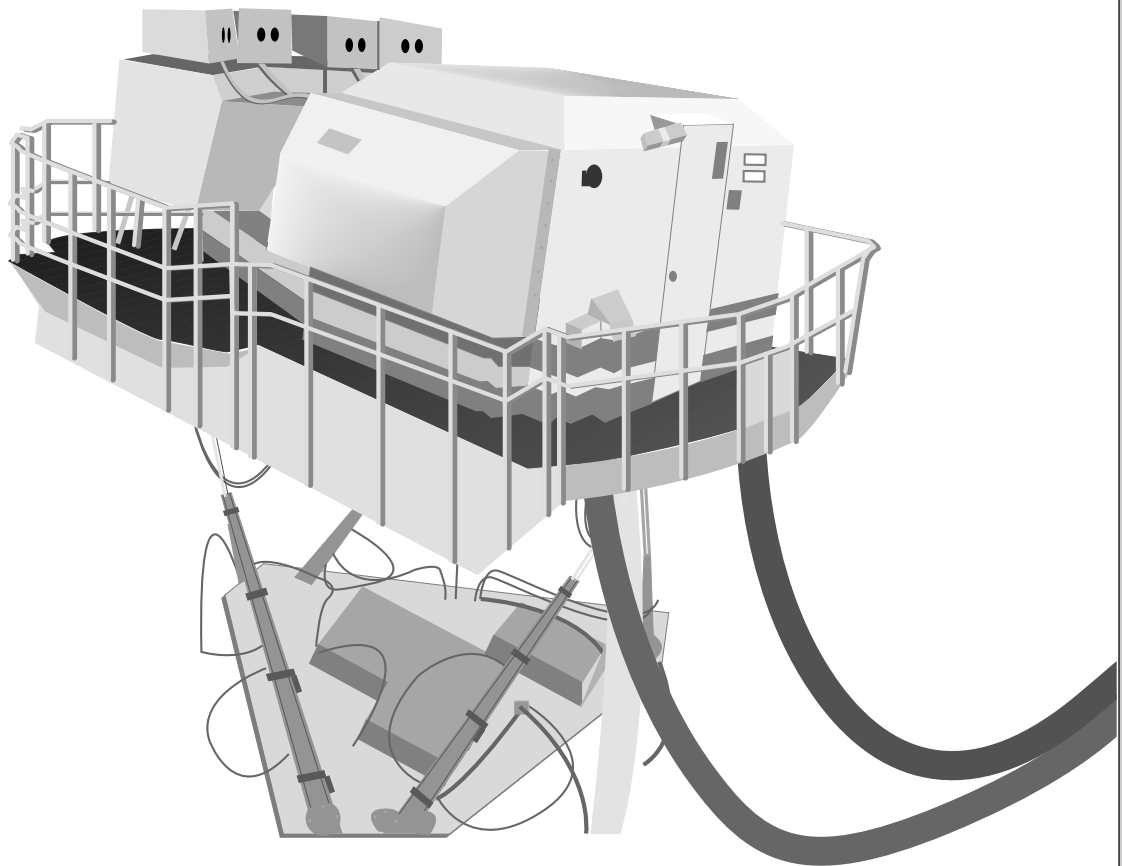
FLIGHT SAFETY FOUNDATION

NOVEMBER 1997

FLIGHT SAFETY

D I G E S T

Facilitating LOS Debriefings: A Training Manual



FLIGHT SAFETY FOUNDATION

*For Everyone Concerned
With the Safety of Flight*

Officers/Staff

Stuart Matthews
*Chairman, President and CEO
Board of Governors*

James S. Waugh Jr.
Treasurer

Carl Vogt
*General Counsel and Secretary
Board of Governors*

ADMINISTRATIVE

Nancy Richards
Executive Secretary

Ellen Plaugher
Executive Support—Corporate Services

FINANCIAL

Brigitte Adkins
Controller

TECHNICAL

Robert H. Vandel
Director of Technical Projects

Robert H. Gould
*Managing Director of Aviation Safety Audits
and Internal Evaluation Programs*

Robert Feeler
Manager of Aviation Safety Audits

Joanne Anderson
Technical Assistant

MEMBERSHIP

Steven Jones
Director of Membership and Development

Susan M. Hudachek
Membership Services Manager

Ahlam Wahdan
*Assistant to the Director of Membership
and Development*

David A. Grzelecki
Librarian, Jerry Lederer Aviation Safety Library

PUBLICATIONS

Roger Rozelle
Director of Publications

Rick Darby
Senior Editor

Daniel P. Warsley
Senior Editor/Writer

Joy Smith
Editorial Assistant

Todd Lofton
Editorial Consultant

Karen K. Ehrlich
Production Coordinator

Ann L. Mullikin
Assistant Production Coordinator

Jerome Lederer
President/Emeritus

Flight Safety Digest

Vol. 16 No. 11

November 1997

In This Issue

Facilitating LOS Debriefings: A Training Manual

1

Effective debriefing of line-oriented simulations (LOS) requires that the instructor understand and use specific techniques of discussion. They include setting expectations; guiding the session insofar as needed to achieve the debriefing objectives; adjusting the facilitations to the level needed to engage the crew as much as possible; drawing out reticent crew members; ensuring that all critical topics are covered; integrating instructional points, as needed, into the crew's discussion; and reinforcing the positive aspects of the crew's behavior.

This issue of Flight Safety Digest is an adaptation of a manual published by the U.S. National Aeronautics and Space Administration (NASA) (Technical Memorandum 112192). Its suggestions are based on the authors' study of line-oriented flight training (LOFT) at several U.S. airlines, including data from a companion study, the authors' subjective impressions, experiences related by LOFT instructors and technical literature about facilitation.

Part 1 of this manual explains the rationale for crew-centered debriefing and the nature of facilitation. Part 2 discusses clarifying roles and expectations and the C-A-L (Crew resource management [CRM]-Analysis-Line operations) model. Part 3 concerns facilitation techniques such as asking questions, use of silence, active listening and use of video. Part 4 offers more specific and detailed methods for using the C-A-L model.

This manual offers frequent scenarios illustrating how to use the techniques provided, as well as strategies for occasions when the debriefing objectives are not being met.

Flight Safety Foundation (FSF) is an international membership organization dedicated to the continuous improvement of flight safety. Nonprofit and independent, FSF was launched in 1945 in response to the aviation industry's need for a neutral clearinghouse to disseminate objective safety information, and for a credible and knowledgeable body that would identify threats to safety, analyze the problems and recommend practical solutions to them. Since its beginning, the Foundation has acted in the public interest to produce positive influence on aviation safety. Today, the Foundation provides leadership to more than 660 member organizations in 77 countries.

Facilitating LOS Debriefings: A Training Manual

Lori K. McDonnell

San Jose State University Foundation

Kimberly K. Jobe

San Jose State University Foundation

R. Key Dismukes

U.S. National Aeronautics and Space Administration

Ames Research Center

Table of Contents

Preface	4
Summary	5
Part 1: An Introduction to Facilitation	6
Instruction vs. Facilitation	6
What You Should Do to Facilitate the Debriefing	7
What You Should Avoid Doing	7
Levels of Facilitation	8
High-level Facilitation	8
Intermediate-level Facilitation	8
Low-level Facilitation	8
Criteria for Effective Crew Participation	9
Criteria for Effective Instructor Facilitation	9
Part 2: Getting Started	9
Clarifying Roles and Expectations: The Introduction	9
The Purpose of the Introduction	9
Why Introductions are Important	9
Important Points to Include in the Introduction	9
The Instructor's Role	9
The Crew's Responsibilities	9
The Rationale for Using Crew-centered Debriefing	10
The Expected Length and Format of the Debriefing	10
A Sample Introduction	10
Debriefing Format	10
Developing an Agenda for the Discussion	10
Organizing the Discussion: The C-A-L Model	10
Part 3: Facilitation Techniques	11
Questions	11
Set the Scene and Ask for Crew Reaction	12
Lead the Crew to Topics	12

Deepen the Discussion	12
Follow Up on Crew Topics	12
Turn Crew Questions and Comments Back to Them	13
Get Crew Members to Actively Participate	13
Drawing Out a Quiet Crew Member	13
Drawing Out an Entire Crew	13
Troubleshooting: When the Crew Does Not Respond to Questions	13
Use of Silence	15
Benefits of Using Silence	15
What to Do During Silence	15
Strategies for Using Silence	15
Active Listening	16
Use of Video	16
Benefits of Using Video	16
Techniques for Using Video	17
Part 4. The C-A-L Model in Action	17
C: CRM — Applying the Company Model	18
Focusing on CRM	18
Reinforcing the Utilization of CRM through Crew Interaction	19
A: Analysis and Evaluation of LOS Performance	19
Getting Crews to Evaluate Their Performance	19
Eliciting Deep Analysis	20
L: Line Operations — Applying Lessons from LOS	21
Get the Crew to Discuss Related Line Incidents	21
Get the Crew to Discuss How to Apply Their Success to Line Operations	21
Get the Crew to Discuss What They Would Do Differently	22
Get the Crew to Discuss How They Will Do Things Differently on the Line Based on Their Experience in the LOS	22
Table 1: C-A-L Model for LOS Debriefings	11
Appendix A: Guidelines for Facilitating LOS Debriefings	23, 24

Preface

This manual is based on our study of LOFT debriefings at several U.S. airlines. The suggestions in this manual are derived from the data from that study, our subjective impressions, the experiences the LOFT instructors shared, and general literature on facilitation. Data and references to relevant literature from the study are available in the published report: *LOFT Debriefings: An Analysis of Instructor Techniques and Crew Participation*, by R.K. Dismukes, K.K. Jobe, and L.K. McDonnell (NASA Technical Memorandum 110442; March 1997).

This material is presented as suggestions rather than rules because facilitation is very much a personal skill and each instructor must develop an approach with which he or she is comfortable. These suggestions provide a tool kit of techniques instructors may draw upon to develop their own style.

This study was funded by the FAA's Office of the Chief Scientist and Technical Advisor for Human Factors (AAR-100). Eleana Edens was the program manager.

Summary

This manual is a practical guide to help airline instructors effectively facilitate debriefings of Line Oriented Simulations (LOS). It is based on a recently completed study of Line Oriented Flight Training (LOFT) debriefings at several U.S. airlines. As a companion piece to the published report of that study (*LOFT Debriefings: An Analysis of Instructor Techniques and Crew Participation*, by R.K. Dismukes, K.K. Jobe, and L.K. McDonnell, NASA Technical Memorandum 110442, March 1997), this manual presents specific facilitation tools instructors can use to achieve debriefing objectives. The approach of the manual is to be flexible so it can be tailored to the individual needs of each airline. Part One clarifies the purpose and objectives of facilitation in the LOS setting. Part Two provides recommendations for clarifying roles and expectations and presents a model for organizing discussion. Part Three suggests techniques for eliciting active crew participation and in-depth analysis and evaluation. Finally, in Part Four, these techniques are organized according to the facilitation model. Examples of how to effectively use the techniques are provided throughout, including strategies to try when the debriefing objectives are not being fully achieved.

Part 1. An Introduction to Facilitation

How much crews learn in Line Oriented Simulations (LOS) and take back to the line hinges on the effectiveness of the LOS debriefing. The simulation itself is a busy and intense experience; thoughtful discussion afterwards is necessary so the crew can sort out and interpret what happened and why. As the instructor, you are expected to encourage the crew members to analyze their LOS performance on their own, rather than lecturing to them about what they did right and wrong. This “crew-centered” approach emphasizes self-discovery and self-critique. The crew-centered approach also draws upon the crew’s professional experience and motivation to perform well to enhance learning.

The rationale for crew-centered debriefings is that adults learn and remember more when they participate actively and make their own analyses rather than when they listen passively to someone else’s. Active participation in the debriefing requires the crew members to process the information more deeply, enabling them to draw upon that information more readily and more effectively in a wide range of line situations.

Another advantage of the crew-centered approach is that crew members who actively discuss Crew Resource Management (CRM) concepts and company procedures tend to “buy-in” more deeply than those who are only given lectures on proper procedures. Therefore, crew members who participate actively may be more likely to transfer learning from the LOS to the line. The goal is for crew members to develop the habit of analyzing their own CRM and technical performance following line operations, a practice which is still rare in civil operations. The LOS debriefing provides an opportunity for showing crews how to debrief and for illustrating the benefits of self-debriefing.

Facilitation does have one distinct disadvantage: it is considerably slower than lecturing so less material can be covered in a short time. Some types of material, such as teaching the mechanics of a hydraulic system, are better suited to lecturing than facilitation. However, this type of instruction is not the primary purpose of the LOS debriefing; the primary purpose is to help crews analyze their performance and identify how they used CRM to manage all aspects of the LOS. (CRM is a method of managing all aspects of flight operations. Thus, discussion of CRM includes flight management issues such as teamwork, workload management, task management, and communication, as well as associated technical issues.)

The facilitation techniques presented in this manual are intended to provide you, the instructor, with a set of tools you can use to effectively facilitate crew-centered debriefings. These tools supplement, rather than replace, the skills you already possess. Becoming skillful at facilitation requires practice, but once mastered it enables you to increase what crew members learn and take back to the line.

- Effective facilitation enables you to meet the following objectives of crew-centered debriefings:
- Crew members discuss issues directly with each other (rather than interacting solely with you, the instructor) and discover as much on their own as possible.
- The crew thoroughly analyzes and evaluates what happened in the LOS, how they handled the situation, what went well, what could be improved, and how to improve it.
- The crew recognizes how CRM techniques helped them manage, or could have helped them manage, the situations they encountered in the LOS.
- Crew members leave the session with a better understanding of how they can use CRM on the line to enhance safety and efficiency.
- The crew is encouraged to develop the habit of self-debriefing following line operations.

Instruction vs. Facilitation

In a crew-centered debriefing, the objective is for you, as the instructor, to facilitate crew discussion so that the crew members do most of the talking, participate proactively, discuss issues with each other, and thoroughly analyze the situations that confronted them as well as how they managed those situations. Some of the CRM literature espouses the ideal that crews debrief themselves and use the instructor as a resource. Realistically, most crews lack sufficient experience in analyzing the CRM aspects of cockpit operations to be able to conduct their own debriefings without assistance. Thus, as the instructor, you need to facilitate the crew’s analysis of their LOS performance and avoid centering the debriefing on your own perceptions. Crews vary considerably in how well they analyze what happened in the LOS and how well they respond to encouragement to participate actively; thus, you must adapt the level of facilitation to the capabilities of each crew. (The levels of facilitation are discussed in detail later in this section.)

The concept of facilitation was originally derived from settings outside of aviation. In some of those settings the facilitator would act only as a moderator of discussion and lacked the technical expertise held by the group members. In the LOS setting, however, you play the dual role of facilitator *and* instructor. Through facilitation you enable the crew to figure things out for themselves; your expertise as an instructor enhances the crew’s understanding of the points they missed on their own.

Facilitation does not require that you withhold your own perspectives. From “the back of the cab” you often see things

the crew does not notice, and you can share your experience in how CRM can be used to manage the specific events that occurred in the LOS scenario. Since crews learn better when guided to self-discovery, you should use facilitation to promote that self-discovery in the crew and encourage the crew members to analyze their performance to the fullest extent possible. Once crew members have completed their analysis, you can reinforce the things the crew did well. For the points crew members miss, you can provide the instruction necessary to ensure the training objectives are met.

Additionally, at times you may need to correct erroneous statements made by the crew and/or provide specific information the crew members lack. This is better done by direct instruction than through facilitation. You can either integrate brief instructional comments into the crew's discussion or provide instruction as needed after crew members have finished their analysis.

When guiding the crew's analysis, you should avoid creating the impression of leading the crew to predetermined answers. The crew will not be motivated to participate unless you convey that the topics, issues, and perceptions they raise are important.

What You Should Do to Facilitate the Debriefing

- Set expectations for crew participation.
- Guide the session to the extent necessary to achieve the debriefing objectives.
- Adjust facilitation to the level needed to engage the crew to the maximum extent possible.
- Draw out quiet crew members.
- Ensure that all critical topics are covered.
- Integrate instructional points as needed into the crew's discussion.
- Reinforce positive aspects of the crew's behavior.

What You Should Avoid Doing

- Avoid lecturing and having the debriefing become an instructor-centered session.

Long monologues, or giving your own analysis and evaluation before allowing the crew to work issues out for themselves, preempt the crew's own analysis and participation. Avoiding lecturing does not mean you cannot teach, but you should teach through facilitation by integrating your own perspectives into the crew's discussion. Rather than telling the crew what they did wrong during the LOS and how they can improve, try to get the crew to

figure it out for themselves. If they discover what they need to work on by themselves, then they are much more likely to learn from their mistakes and carry that learning over to the line.

- Avoid giving your own analysis and evaluation before the crew has completed their analysis.

Crews learn the most from their LOS experience when they make their own analyses. It is important that crew members learn to analyze and evaluate their own performance so that they can develop the habit of debriefing their performance following line operations. If you give your analysis before the crew does, the crew will feel less responsible for making their own analysis. When a second instructor is playing the role of a crew member, he or she should participate as a crew member but should wait and give his or her analysis after the "real" crew members have had the opportunity to analyze their performance as a crew.

- Avoid giving the impression that only your perceptions are important.

You need to make it clear to the crew that you are interested in what they have to say in order to encourage them to participate actively and analyze and evaluate their performance in depth.

- Avoid interrupting crew discussion.

Interrupting shows a lack of interest in the crew's views and may disrupt their train of thought and hinder their process of self-discovery. Interruptions also undermine the crew's sense of responsibility for making their own analysis and evaluation. Rather than interrupting a crew member, try writing a note to yourself and then bring up your issue after the crew member has completed his or her comment. (Interrupting may be necessary if a crew member makes a statement contrary to your company's SOP or the FARs.)

- Avoid interrogation; be positive when discussing problems.

In order for the crew to be able to take responsibility for initiating topics and discussing issues interactively, you must work to keep the discussion crew-centered. Asking questions in a manner that resembles interrogation, rather than guidance, can hinder crew discussion, forcing the crew into a reactive, rather than a proactive, role.

- Avoid having a rigid agenda.

Have the crew help develop the agenda to encourage them to identify areas in the LOS where they did well and/or need improvement. Keep the focus of the debriefing on topics introduced by the crew, but introduce your own points as necessary to expand on crew-initiated topics and to cover important issues not initiated by the crew.

- Avoid shortchanging high-performing crews by cutting their sessions short.

Do not assume that because a crew did well there is nothing to talk about so a shorter session will suffice. Crews that perform well may not know why the LOS went well. Make sure that these crews recognize and discuss which CRM techniques resulted in their positive outcomes so the crew members can transfer this knowledge to other situations and when pairing with other crew members on the line. Good crews can learn from analyzing what they did well and why it worked. By analyzing their performance the crew can learn what strategies were effective and how to use those strategies on the line. Crew members are more likely to transfer effective performance to the line if it [effective performance] has been reinforced by discussion.

Levels of Facilitation

Your role as the instructor in the debriefing session will vary as a function of the level of facilitation needed for each crew. Ideally, the crew will be able to analyze and evaluate their own performance and you will need to give only minimal guidance, thus utilizing high-level facilitation. Unfortunately, this rarely happens in the current training environment. Most crews lack the experience to participate at this level. Thus, you must adapt to the capabilities of each crew. Currently, most debriefing sessions are conducted at an intermediate level of facilitation. These sessions are largely driven by the instructor, who leads the crew to important topics and utilizes questions to evoke in-depth analysis and evaluation by the crew.

The level at which facilitation is conducted is a broad continuum from high (most desirable) to low (least desirable). To illustrate this, we will discuss the high, intermediate, and low ranges in detail. Be aware that you may need to adjust the level of facilitation to whatever level is appropriate throughout the session. You should always strive to work at the highest level of facilitation (i.e., the least interference on your part) at which each crew is able to respond. If you facilitate at too low of a level (i.e. more interference from you) the crew will be prevented from participating to their full capability. A sign of skillful facilitation is being able to recognize what level is appropriate for each crew, as well as being able to adapt to the varying needs of individual crew members as the debriefing discussion shifts from one topic to another. If you consistently use facilitation to generate crew-centered debriefings, crews will gain experience as they go through recurrent LOS and they will participate at increasingly higher levels each year.

High-level Facilitation

High-level facilitation is possible when the crew discovers and discusses important issues on their own with little guidance. Debriefing at this level provides the deepest and most enduring

learning because the crew members guide their own self-discovery. For facilitating at this level, the crew members must be able to identify important topics and issues that arose during the LOS, set an agenda for discussing these issues, and critically analyze the situation they faced and evaluate how well they performed.

At this level of facilitation, your role as the instructor is to inform the crew of the objectives for the debriefing, outline the debriefing process, and assist in guiding the discussion only when necessary. As the instructor, from your advantaged position as an experienced observer, you serve as a resource for the crew to help reinforce crew observations and supplement their perceptions. Although you retain responsibility for ensuring that the debriefing objectives are met, you achieve this through general guidance rather than leading the discussion moment-to-moment.

Intermediate-level Facilitation

When crew members are not as adept at conducting their own analysis and evaluation of the LOS, you must lead the discussion more directly. At the intermediate level of facilitation you may have to help the crew discover important issues and lessons by asking questions which lead them to specific issues and topics. You may also need to encourage the crew to analyze the situation and their performance in greater detail. At this level, crew members are able to achieve self-discovery through analysis and evaluation of their performance with your guidance. You may need to supplement crew analyses substantially, but should do so only after the crew members have completed their own analysis.

Low-level Facilitation

Low-level facilitation does not imply inadequate facilitation on your part as the instructor; rather, it is the necessary and appropriate level to use when crews do not respond to higher levels. When crew members show little initiative and respond only superficially to your efforts to get them to analyze the LOS situations and evaluate their own performance, you may be forced to be more direct and to lead the discussion step-by-step. However, few crews are truly incapable of participating at a higher level. (Before retreating to this level of facilitation, be sure that you are not unwittingly discouraging crew participation by conveying the tone of an interrogation or by showing a lack of interest in what the crew members say.) At this level, self-discovery by the crew is limited but you should still use facilitation techniques to lead the crew to critical issues, appropriate solutions, and correct evaluation. At the end of the discussion of each topic you may have to explicitly summarize the nature of the problem encountered in the LOS and describe how it should be handled. When low-level facilitation is necessary, continue trying to elicit crew participation at a higher level. If it becomes necessary to

instruct the crew on important points, confirm that they understand and agree, and continue to encourage them to initiate further discussion on their own.

Criteria for Effective Crew Participation

In order to determine the appropriate level of facilitation to use, you need to be aware of how capable the crew members are of participating. The following criteria can be used to determine what level is appropriate for each crew at various times during the debriefing. If the crew members meet all of these criteria, high-level facilitation is best. If not, intermediate- or low-level facilitation may need to be used.

- Crew members *analyze* in depth their LOS performance, discussing the situations they confronted, what they did to manage the situations, and why they made the decisions and performed the actions they did.
- Crew members *evaluate* in depth their LOS performance, discussing what went well, what did not go well, and how their performance could have been improved.
- Crew members *discuss* how CRM techniques helped them manage or could have helped them manage the situations they encountered in the LOS.
- Crew members *address* each other directly and interactively discuss the LOS rather than merely respond to your direction.

Criteria for Effective Instructor Facilitation

Your effectiveness in facilitating the debriefing can be measured according to the following criteria:

- You facilitate the crew discussion at the highest level possible, guiding the discussion only to the extent necessary to help the crew accomplish the objectives of the debriefing.
- You modify the level of your facilitation to accommodate the crew's needs throughout the debriefing. If the crew does not need guidance, you refrain from interfering with crew discussion. If the crew needs guidance, you use intermediate-level strategies to elicit continued and/or deeper discussion and revert to low-level facilitation only if necessary to ensure important lessons are learned.
- You ensure that the crew members analyze their performance in depth, identify CRM techniques that played or should have played a role in the LOS, and discuss the LOS with each other in an interactive way.
- You ensure that all critical topics are covered.

Part 2. Getting Started

Clarifying Roles and Expectations: The Introduction

The Purpose of the Introduction

- To explicitly state how the crew should participate in the debriefing and how you, the instructor, will participate.
- To provide a persuasive rationale for crew-centered debriefing.

Why Introductions are Important

- The crew can't be expected to participate in a certain way if they are not told *how* they are expected to participate. Individuals want and need to know what is expected of them.
- A good introduction encourages the crew to take responsibility for the debriefing session.
- Introductions have been shown to increase the amount and depth of crew participation.

Important Points to Include in the Introduction

Effective introductions should address all of the issues in the following four categories.

The Instructor's Role

- Outline the process for the debriefing and help establish an instructor agenda.
- Help the crew identify topics and facilitate crew discussion as necessary.
- Act as a resource for CRM and technical issues.
- Keep discussion crew-centered rather than instructor-centered.
- Ensure that the training objectives are met.

The Crew's Responsibilities

- Raise issues and initiate discussion.
- Discuss issues directly with each other rather than only with the instructor.
- Discuss CRM techniques used during the LOS and other techniques which could have been used profitably.

- Critically analyze the situations that were encountered and how they attempted to manage those situations.
- Evaluate how things turned out and why. Discuss what, if anything, they would do differently in the future.

The Rationale for Using Crew-Centered Debriefing

- Crews learn better through self-discovery and self-analysis than by lecture.
- It draws upon the crew's professional expertise and motivation to perform well.
- It helps the instructor understand the crew's performance.

The Expected Length and Format of the Debriefing

- Tell the crew how long the session will last (so they will not be motivated to keep quiet in hopes of a short session). A thorough crew-centered debriefing can usually be accomplished in an hour.
- Tell crews explicitly what format will be used for the debriefing (e.g., setting an agenda of topics to discuss, using videos to introduce and supplement discussion, using the model presented in this manual to keep focused on important topics).

A Sample Introduction

"How much you learn from the LOS depends on discussing it afterwards: Analyzing the *situations that confronted you*; analyzing *what you did to manage those situations*; evaluating *how well it worked out*; and identifying anything you might want to do differently. It is very important that you make this analysis on your own. We all know how much more we learn when we work something out ourselves than when we listen to a lecture about it, especially if it concerns our own performance. So, if you are expecting a lecture from me, forget it!

"I realize that debriefing yourselves may be new to you, so I will act as a guide and help you get started. I encourage you, however, to take the initiative instead of waiting for me to raise issues. When you see the video, please analyze what happened, what you did to manage the situation, and why you did it that way. What was the most difficult aspect and why? What CRM issues were involved and what CRM techniques did you use? We are not looking for a scripted solution here, because every situation on the line is a little different. The point of this exercise is for you to develop the habit of analyzing line situations and to determine for yourselves how to best use all of your resources to manage those situations.

"I expect you to do most of the talking, raise questions about what was going on, identify issues, and volunteer your perspectives. You can use the agenda of topics we develop to

structure your discussion. For each topic you need to go beyond just describing what happened and what you did. You need to dig deep, to analyze why it happened that way, what management techniques seem to work best, and what you might have done differently. This works best when you discuss the issues with each other and reach your own conclusions about the factors that contribute to successful operations. This session will last about (x) minutes. I have marked several places on the video that illustrate interesting aspects of the flight. But, before we start looking at those video segments, what portions of the flight do you feel are most important to discuss?"

Debriefing Format

Developing an Agenda for the Discussion

A primary debriefing objective is for discussion to be crew-centered. As the instructor, you play a critical role in helping the crew develop a structure for their discussion and in ensuring that all important issues that arose during the LOS are covered. It is important to get the crew members to actively participate in developing the agenda so they can develop the skill of identifying issues that arise in line operations.

Ask the crew to identify any topics, situations or performance issues they would like to discuss. Remind them to include aspects of their performance that worked well, not just aspects that might be improved. The issues you noted during the LOS are also an important part of the debriefing agenda. As the instructor, you need to ensure that all critical issues are covered. You can introduce issues not identified by the crew at an appropriate point during the debriefing. (A good way to improve the ability of crews to identify issues for discussion is to suggest during the pre-LOS briefing that they make note of issues they want to discuss in the debriefing.)

Typically, it is easiest to discuss phases of the flight in chronological order so videotaped segments of the LOS performance can be incorporated into the discussion without requiring extensive searching on the VCR. However, this is largely a matter of personal preference and some instructors prefer to start the discussion immediately when crew members suggest a topic in order to reinforce the crew's initiative. One advantage of showing video segments related to each topic is that after viewing their performances objectively, crew members may be better able to analyze and evaluate their performances in depth.

Organizing the Discussion: The C-A-L Model

The C-A-L Model (Table 1) incorporates three main concepts: CRM (C); Analysis and evaluation of LOS performance (A); and application to Line operations (L). This model provides a simple framework for crew discussion of each LOS situation or topic. Posting a copy of the model (Table 1, page 11) on the wallboard will help remind the crew of each aspect of their

Table 1
C-A-L Model for LOS Debriefings

C CRM — Applying the Company Model

Use wallboards with list of CRM concepts.

- Tie CRM concepts and techniques to operational issues.

Put CRM into practice.

- Crew discussion of the LOS should be interactive.

A Analysis and Evaluation of LOS Performance

Explicitly evaluate performance during the LOS.

- How effective was management of the situation?
 - What went well, and why?
 - What could be improved, and how?

Interactively analyze the situation confronted.

- What happened?
- How was it managed (include CRM techniques utilized)?
- Why was it managed that way?

L Line Operations — Applying Lessons from LOS

Discuss how the LOS performance and associated CRM issues relate to line operations.

- Discuss related line incidents that illustrate CRM issues.
- Discuss how to apply LOS success to line operations.

Discuss how things could have been done differently.

- What could have been done differently to improve the outcome in the LOS?
 - What CRM techniques could have helped?
 - How could you turn *areas for improvement* into *strengths*?
- What can be done to prevent or manage similar situations on the line?

performance they should address. Part 4 of this manual addresses in detail how to put this model to work.

Part 3. Facilitation Techniques

Part of your role as the instructor is to ensure that the crew members analyze and evaluate LOS situations, and their performance, in depth. One of the greatest difficulties you may encounter is getting the crew to go beyond a superficial description of LOS events. The objective is to encourage crew members to not just discuss what happened—they should discuss why they did what they did to manage the situation, and *why* the situation turned out the way it did. Discussing *why* helps crew members better understand what knowledge

and information played a role in their decision-making process, which in turn can help them learn to make better decisions in the future.

This section will demonstrate how to effectively use the techniques that are essential to successful facilitation. The next section (Part 4) will show how to integrate these techniques utilizing the C-A-L model.

Questions

Questions are useful to guide the crew to important topics and encourage them to analyze and evaluate their LOS performance in depth. Although questions are one of your most useful tools,

you should be wary of dominating the discussion with your own questions. To the extent necessary, you can use questions to help the crew members identify issues and follow up on topics, and to encourage them to thoroughly analyze their performance through direct discussion with each other. Ideally, questions should be phrased to require more than a simple “yes” or “no” answer; questions should push a crew to analyze its performance at a deeper level.

Note: The examples used in this section were taken from actual debriefings. The participant’s titles have been substituted for names:

IP = Instructor Pilot

FE = Flight Engineer

CA = Captain

FEI = Instructor acting as Flight Engineer

FO = First Officer

Set the Scene and Ask for Crew Reaction

A good way to start a discussion of a LOS event is to show the video segment, and/or describe the situation, and then ask an open-ended question: “What went well (or not so well) there?” or “What lessons can be learned from this?”

If the crew does not respond, try again with a more focused question: “Is there anything you would do differently if you had it to do over?” or “Did you see anything in the video that was not SOP?”

Lead the Crew to Topics

If the crew members seem unsure of what to discuss next, or if they overlook an important aspect of a situation, you may need to ask a question to focus their attention on some topic or aspect. However, be careful to phrase the question so it is not easy to answer with a simple “yes” or “no” and so it does not leave the crew with nothing to say.

Effective:

IP: What else about how you handled that emergency situation can you discuss?

CA: Well now that you mention it I guess we did get a little bit rushed there and we didn’t communicate as well as we could have.

Ineffective:

IP: Did you get a little rushed at that point, making communication a little more difficult?

CA: Yeah, we did.

Deepen the Discussion

Once the crew has begun to discuss a topic, you may need to encourage them to explore in more depth what happened. Ask questions that require the crew members to explore their

thoughts and actions in the LOS. Avoid asking questions that give the answer or leave little for them to say.

Effective:

IP: Was there anything that made you uncomfortable during that first leg?

FO: Well, yeah, I guess the R-Nav approach did. I wasn’t comfortable with it because I didn’t know we could shoot an R-Nav approach in there; I thought we were supposed to shoot a VOR.

—or—

IP: Was there anything that made you uncomfortable during that first leg?

FO: Uh...not that I can think of.

IP: What about the R-NAV approach?

FO: Well, yeah, I guess the R-Nav approach did. I wasn’t comfortable with it because I didn’t know we could shoot an R-Nav approach in there; I thought we were supposed to shoot a VOR.

Ineffective:

IP: You seemed a little uncomfortable with that R-NAV approach. Were you?

FO: Well, yeah, I guess I was.

Follow Up on Crew Topics

It is important to follow up on topics initiated by the crew members and to encourage the crew to explore their topics fully. Following up on crew topics demonstrates to the crew that their thoughts and ideas are important and reinforces their initiative. To obtain greater depth and detail on topics initiated by the crew members, ask questions that begin with *what*, *how*, and *why*. For instance, in the first example below, the more skillful instructor follows up and gets the CA to comment on the FE’s observation while the less effective instructor moves on to another topic. In the second example, a more in-depth answer is elicited by the more effective instructor.

Effective:

FE: I think I should have just taken care of that for CA; tried to get that system back.

IP: Let’s talk about that. How did you feel about it, CA?

CA: Well, at that particular point I knew we had to stay away from the rocks, we had isolated the hydraulic system, and I was just not comfortable giving up control of the airplane to FO. I just wanted to fly out of there. I had B system, and it’s a lot more powerful than the standby A system, so I really didn’t need that system back.

Ineffective:

FE: I think I should have just taken care of that for CA; tried to get that system back.

IP: I agree. Now, what’s next on the list?

Effective:

FO: I felt pretty comfortable on the single-engine approach.

IP: Yeah? Why? What made you feel comfortable?

FO: *[describes in detail why he thought he did so well]*.

Ineffective:

FO: I felt pretty comfortable on the single-engine approach.

IP: Yeah, I thought you handled it well, too.

Turn Crew Questions and Comments Back to Them

If a crew member makes a comment or asks a question, avoid using this as a springboard for presenting your own perspectives. Instead, turn the topic back to the crew for discussion. Continue to redirect their questions and comments to encourage the crew to work out answers for themselves. Your questions are a powerful tool for blending your observations into the discussion without dominating. After the crew members have addressed everything they can, you can add teaching points they have not yet discovered.

Effective:

FO: I don't know what happened there. Did I overrotate?

IP: Did you overrotate?

FO: Well I started going through it at about twenty degrees.

CA: Well, we may have gone over twenty just a little bit.

IP: Why don't you talk about that?

Effective:

CA: How did you think we reacted as a crew to that compound emergency?

IP: *I'll save my remarks for the end. Each of you tell us how you think you reacted as a crew to the emergency.*

Get Crew Members to Actively Participate

It is important to ensure that all members of the crew actively participate in the debriefing so they can all experience the higher level of learning that results from taking an active role in the learning process. Also, the crew cannot fully analyze and understand their performance as a team without each member's perspective. The following techniques can be used to promote active participation by all crew members.

Drawing Out a Quiet Crew Member

If one crew member does not volunteer comments and responds only minimally to questions, you can use several techniques to encourage his or her participation:

- Ask the quiet crew member to discuss how effectively the crew performed in the LOS.

It is relatively easy to respond to this type of question because there is no right or wrong answer and all crew members are likely to have an opinion.

Effective:

FE: How effectively do you think you performed as a crew in resolving the TCAS alert incident?

- Redirect a question to the quiet crew member.

If your questions are predominantly answered by the same crew member, repeat the question after the dominant crew member has responded so that the quiet crew member will be required to participate and communicate his or her opinions and ideas.

Effective:

IP: How did you like that first leg? What did you like about it?

FO: *[describes what he feels went well on the first leg]*.

IP: CA, what did you like about the first leg?

CA: *[describes the things she thinks went well]*

- Ask the quiet crew member to expand on what another crew member said.

If a crew member sits silently while another does all of the talking, it may be helpful to ask the silent one to expand on what was said by discussing a new aspect of the topic. This technique will make it easier for the quiet member to find something to say.

Effective:

FO: How do you think, as a crew, you could have handled the situation the CA was discussing?"

Drawing Out an Entire Crew

Sometimes all or most of the crew members are unresponsive and getting them to participate seems like pulling teeth. When this happens, you should first review your own participation to ensure that you are not unwittingly sending covert messages that discourage crew participation. To instigate crew participation, it may be helpful to start with the more junior members so they will not be put in the position of potentially disagreeing with the CA early in the session. The next section suggests specific ways to stimulate participation when crews do not immediately respond.

Troubleshooting: When the Crew Does Not Respond to Questions

If crew members do not immediately respond to questions, the following techniques may be helpful in eliciting responses. Start with the highest level of facilitation and progressively

work down only through the levels necessary so that facilitation stays at the highest level possible.

High-level Facilitation

- Use silence/pauses to elicit crew responses.

Pause at least three-to-four seconds after asking a question rather than immediately answering for the crew. Most crew members will feel motivated to say something to end the uncomfortable silence (see the following section: Use of Silence).

Effective:

IP: Has there ever been a flight where errors didn't occur?

CA: No.

IP: And what do we want to have happen when errors do occur?

[IP waits eight seconds]

CA: We want somebody to say something and correct the error.

IP: Exactly.

Ineffective:

IP: Has there ever been a flight where errors didn't occur?

CA: No.

IP: And what do we want to have happen when errors do occur?

[IP becomes uncomfortable when crew doesn't answer right away and answers for them.]

IP: We want someone to notice that error, don't we?

Intermediate-level Facilitation

- Reword questions rather than give answers.

When crew members do not answer a question after five-to-ten seconds of silence, it may be necessary to rephrase the question to make the intent of the question clearer or to ask a more specific question. If they still do not answer, again pause to allow them time to formulate a thoughtful response. Rephrasing the question may give the crew members the cue they need to spark a response, as demonstrated in the examples which follow. By being persistent and patient, you reinforce that the crew members are responsible for their own learning and that they are not going to get away with passively sitting by and waiting to be told the answers. When you answer for the crew, or re-phrase questions in a way that leaves little for the crew to say, you inhibit in-depth crew participation, and hinder crew learning.

Effective:

IP: How did you manage the situation that arose?

[The crew does not respond, so the IP asks a more specific question.]

IP: What CRM techniques did you use to resolve the situation?

CA: I created time by letting the FO fly the plane while I ran the emergency checklist.

Ineffective:

IP: How did you manage the situation that arose?

[The crew does not respond, so the IP answers for them.]

IP: You created time, didn't you?

Effective:

FO: I don't like the idea of rolling the trim all the way down and then forgetting about it.

IP: I agree. What do you think they could do to make that better?

FO: Uh... *[trails off]*

[Rather than answering for the crew, the IP rephrases the question to clarify what was not understood.]

IP: What could you do to take care of that if you were redesigning the checklist?

FO: I would reorganize the section on de-icing and have another after-start checklist because that's where the confusion is. That's where the flow is broken up.

Ineffective:

FO: I don't like the idea of rolling the trim all the way down and then forgetting about it.

IP: I agree. What do you think they could do to make that better?

FO: Uh... *[trails off]* *[IP rephrases the question, but new question leaves little for crew to say.]*

IP: Couldn't they reorganize the checklist so that item appeared sooner?

FO: Uh, yeah, I guess so.

Effective:

If the crew does not respond to the question "What was the weak part of your V₁ cut?" (and the problem was that they were trying to do a checklist and struggle with the airplane when they could have had the autopilot on), rather than pointing that out for them, ask a more specific question.

- "What other resource could you have been utilizing at the time to help in that situation?"

Effective:

If the crew does not respond to the question, "Why didn't you finish the checklist?" and the reason they didn't finish was that they were distracted by a warning light, rather than saying it for them, ask a more specific question.

- "Was there something that distracted you during the checklist?"

Low-level Facilitation

- Answer for the crew, but confirm that they understand and agree.

If the above facilitation techniques still do not elicit a response from the crew, or if the response given lacks depth, it may be necessary to briefly instruct the crew to ensure that they learn from the situation so they can apply the lesson on the line. If it becomes necessary to instruct the crew on certain issues, be sure to verify that they understand and agree because if they don't the opportunity for learning may be lost. It is important to continue trying to involve the crew as much as possible. Once you have shared your knowledge with the crew, and elicited their agreement, try to return to a higher level of facilitation by asking for the crew's opinion, asking them to expand on the issue, or asking them to give an example of what you discussed from their line experience.

Use of Silence

Silence can be a very useful tool to elicit thoughtful crew responses. Most people are uncomfortable with silence in a group setting and are more likely to make some kind of response the longer the silence lasts. Without realizing it, instructors often allow only a second or two for a response to their question before either calling on someone else or giving the answer. However, a second is generally not long enough to formulate a thoughtful response, especially to complex questions.

Benefits of Using Silence

Studies show that waiting three-to-four seconds after asking a question greatly improves the number and quality of responses. The specific benefits of pausing at least three seconds include:

- crew members produce longer and more confident responses.
- crew members are more likely to volunteer unsolicited responses.
- crew members interact more with each other.
- crew members ask more questions.
- less articulate crew members participate more.

What to Do during Silence

In order to minimize the discomfort often associated with even brief periods of silence, it is important to behave in a way that makes the crew feel at ease.

- Look relaxed, not anxious or impatient.

For the crew to feel comfortable with silence, it is important that you appear at ease. Appearing tense and anxious will give the crew clear non-verbal cues that silence is not appreciated.

- Sit back.

Sitting on the edge of your seat may be interpreted by the crew as a sign of impatience. Sitting back in your seat, however, helps demonstrate that you are comfortable allowing periods of silence for the crew to think before they respond.

- Smile.

Smiling conveys reassurance and acceptance, which can help put the crew at ease.

Strategies for Using Silence

Silence can be used throughout the session to encourage crew participation, not only after asking a question but also after crew comments. Using silence is a high-level facilitation strategy—if silence alone does not elicit crew discussion, try the next level of facilitation.

High-level Facilitation

- Pause after asking questions to allow crew members to formulate thoughtful responses.

When crew members do not immediately respond, be patient; remain silent rather than answer for them.

Effective:

IP: How did you feel things were going on the first leg overall, FO?

FO: Uh... *[trails off]*

[IP waits six seconds]

FO: I felt a little disorganized pushing off of twenty-three and taxiing out, and doing all of that and then having to de-ice. That breaks your flow because you don't put the flaps down. So it just seemed backwards to me.

Ineffective:

IP: How did you feel things were going on the first leg overall, FO?

FO: Uh... *[trails off]*

[IP answers for him.]

IP: You felt a little uncomfortable, didn't you?

- Pause after crew comments to allow crew members to resume discussion.

When there is a lull in crew discussion, be patient and wait for the crew to say more rather than immediately adding your own input.

Effective:

IP: FO, what do you think about what CA just said?

FO: I think we all agreed it was a thousand. I was flying and still listening to what they were saying and it sounded okay to me.

[IP pauses eight seconds]

FE: I think that things worked out pretty well because when FO was flying he was doing a good job and we didn't have to worry about that part.

CA: Yeah, I agree with you FE. I was comfortable with FO's flying the airplane even when I was out of the loop because he was always ahead of the airplane.

Intermediate-level Facilitation

(Also see Troubleshooting in the previous section.)

- Ask crew to comment or elaborate on what was just said.

If the crew does not resume discussion after a period of silence, encourage further discussion by asking them to elaborate on their previous discussion.

Effective:

IP: FO, what do you think about what CA just said?

FO: I think we all agreed it was a thousand. I was flying and still listening to what they were saying and it sounded okay to me. *[IP pauses eight seconds, then asks crew to elaborate.]*

IP: FE, how do you think this situation turned out?

FE: I think that things worked out pretty well because when [FO] was flying he was doing a good job and we didn't have to worry about that part.

Low-level Facilitation

(Also see Troubleshooting in the previous section.)

- Reinforce what the crew said.

If the crew does not resume discussion after a lengthy silence and cannot elaborate further, use the opportunity to provide the crew with positive feedback on the issue they were discussing. Not only will the feedback reinforce the issue at hand, it will also reinforce crew discussion in general.

Active Listening

Good listening skills are as important to an instructor as good speaking skills. Active listening is one of the most useful tools you can use to encourage continued participation. It shows the crew that you are listening and paying attention to them, and that you understand what they are saying which, in turn,

encourages them to keep talking. Active listening ranges from simple non-verbal gestures to expanding on crew comments. In all cases, the objective is to encourage the crew to keep talking and, in the more complex forms, to encourage deeper discussion of the issues. The following are examples of the various levels of active listening, in order, from the simplest to the most complex.

- Non-verbal.

Nod, smile, make eye contact, sit forward in your chair, or otherwise indicate that you are interested in what is being said.

- Short interjections.

Interject with "Yes?", "Uh-huh...", "I see...", etc., to indicate that you are following what they are saying and to encourage them to say more.

- Echoing.

Repeat part of what the speaker said as a question directed back to the crew (e.g., "So you weren't sure if you were cleared for takeoff?").

- Reflecting.

Repeat what the speaker said in different words while retaining the same meaning (e.g., if speaker says "We didn't use good communication," you might respond with, "You didn't let each other know what you were doing?").

- Expanding.

Expand on what the speaker said by implying more than the speaker intended (e.g., if speaker says, "We didn't use good communication," you might respond with, "So if you had communicated better you could have avoided getting overloaded?").

With all of these active listening techniques, the most important aspect is the tone you convey to the crew. It must be apparent from your tone that you are genuinely interested in what they have to say. Furthermore, you must convey that you are interested in their perspectives, not just in leading them to predetermined answers.

Use of Video

The videotape of the LOS session is a useful tool for enhancing the debriefing. Relevant events need to be marked on the tape during the LOS session so you can draw the crew's attention to important points for discussion.

Benefits of Using Video

An important contribution of videos may be to remind crews what transpired at critical segments during the LOS because it

is often difficult for participants to remember specific details of the typically long and stressful sessions. Videos enable crews to review their actions and then examine and gain insight into their behavior with the detachment of observers. Videos can also encourage self-assessment by helping crew members identify behaviors that were either helpful or harmful to the outcome. The realistic feedback that videos provide can make it easier for you to involve the entire crew in a discussion of team performance, thus enhancing the overall potential of the training session.

Techniques for Using Video

■ Index important events.

From your experience with the LOS scenario you will be aware of critical events that will challenge the crew. Index those events on the videotape during the LOS and make notes to remind yourself of important points to discuss. Also, index noteworthy examples of good and poor crew performance.

■ Do not show a video segment unless you intend to discuss it.

The purpose of showing the video is to enhance crew analysis by refreshing their memories and giving them the opportunity to objectively evaluate their performance. If you show a video segment without discussing it, you waste both time and the opportunity for discussion.

■ Avoid showing a large number of segments or very long segments.

In a one-hour session, 3–6 segments are usually all you will have time to adequately discuss. Try to select these 3–6 short segments to illustrate some major aspects of crew performance (good or bad) rather than showing an entire phase of flight (e.g., from top of descent to touchdown). For aspects of a crew's performance that cannot be clearly illustrated by the video, it is best to steer the discussion to these topics without introducing them with a video segment.

■ Be proficient in the use of the video equipment.

Be very familiar with the video equipment so you can quickly find the events marked on the tape. Use the automatic index marker to find events—playing the video in fast forward while searching for segments wastes time and distracts the crew.

■ Introduce each video segment.

Set the scene by describing the situation and where in the flight the segment to be discussed occurs. You may also find it useful to remind the crew that they will be expected to analyze what they see.

Effective:

“This segment starts just as you were lifting off from LAX. I want you to watch what happens—think about

your performance and what you were thinking as you began to realize something was not right so, after the video, you can analyze what happened.”

Ineffective:

“Okay, here's something I wanted you to see.”

■ Pause for comments.

Pause the video when you or a crew member make a comment so the comment can be heard and understood. Crew members will feel that you are genuinely interested in what they have to say if you pause to give them your undivided attention.

Effective:

FO: You know, another thing that concerned me *[IP stops video so FO's comment can be heard]* was how we turned directly in to intercept the localizer and it happened quicker than I expected.

Ineffective:

FO: You know, another thing that concerned me was how we. . . *[IP does not stop video, so remainder of FO's statement can't be heard over the VCR.]*

■ Pause to discuss important issues.

Pause the video to call attention to, and elicit crew discussion of, a specific aspect of crew performance shown on the video. For example, rather than talking during the video and forcing the crew to compete with the noise, stop the video and encourage crew discussion.

Effective:

- “Okay, let's just stop here. How did you communicate to ATC what you needed from them with regard to the hydraulic problem?”
- “All right, let's just pause it right here for a second. What did you just do there?”

Part 4. The C-A-L Model in Action

The C-A-L Model provides a way to structure the debriefing. The first section, CRM, suggests strategies for helping the crew focus on CRM techniques that played a role in the LOS. The second section, Analysis and Evaluation, shows how to guide crews to identify and evaluate aspects of their performance that went well, or could use improvement, including analysis of why the crew did what they did and why things turned out the way they did. The third section, Line Operations, provides a structure for helping the crew explore how they can apply what they learned from their analysis of the LOS to line operations.

A good way to organize debriefing each segment of the LOS is to show the appropriate video segment and then use the components of the C-A-L Model to guide the discussion.

C: CRM — Applying the Company Model

The major purpose of LOS is to give crews a chance to practice using CRM concepts and techniques in realistic flight scenarios. Typically, crew members are much better prepared to talk about the purely technical aspects of a flight situation than the CRM aspects so they may need to be guided toward discussion of CRM issues pertinent to their performance in the LOS. Rather than discussing CRM as a set of abstractions, you can help crews the most by guiding them to consider how specific CRM techniques can be used to manage various flight situations.

Focusing on CRM

You can use several techniques to bring CRM into the crew's discussion in a concrete, relevant way.

■ Refer to the posted CRM concepts.

Each company teaches a specific framework for CRM concepts that reflects the company's philosophy. Posting this conceptual framework on wallboards and referring to it during the discussion can help the crew relate CRM concepts and techniques to specific operational situations.

Effective:

IP: Which of these crew effectiveness markers do you think you used to resolve that de-icing report problem?

FO: We used "Inquiry and Assertiveness" and "Vigilance" making sure everything was okay.

Effective:

IP: What CRM technique do you wish you might have used a little better?

CA: "Anticipate required actions and workload distribution." That was a tough one for us because we were both very busy and there's not much he can do except fly the airplane if he's flying. We're supposed to each follow along on these checklists, and I think that's something we could have been better at.

IP: What techniques can you use to manage workload better in the future?

Effective:

[The CA tells the FO to ask ATC for a holding pattern in order to have time to do a manual gear and flap extension during a video segment. The instructor stops the video, points to the posted CRM markers and asks questions.]

IP: What CRM principle is that an example of?

CA: Create time.

IP: And how did you create time?

■ Use CRM-specific questions.

Get the crew to explore specific CRM issues and techniques that presented themselves during the LOS.

Effective:

- "What CRM techniques might have helped in this particular situation?"
- "What specific CRM techniques did you use that resulted in your successful outcome?"
- "What kinds of challenges did the LOS present in terms of how to manage your time?"
- "Looking at your workload management, what CRM techniques did you use in this LOS that you learned in ground school?"

■ Use guiding questions.

Guiding questions can be used to lead the crew to more specific and in-depth aspects of their LOS performance. In the following example the instructor encourages the crew to discuss specific aspects of teamwork that occurred during the LOS.

Effective:

IP: Did you feel included?

FO: Yes.

IP: What did the CA do to make you feel included?

—or—

IP: Did you feel included?

FO: Not really.

IP: What could the CA have done to make you feel included?

In the next example, the instructor facilitates crew discussion of specific aspects of workload management that occurred during the LOS.

Effective:

IP: Did you feel rushed or overworked or distracted perhaps?

FO: Yeah, I felt like I wasn't ready to turn in.

IP: But you turned in anyway?

CA: Yeah, I was ready. I didn't ask you [FO] if you were ready though.

IP: You weren't ready, FO? And could you have said something to the CA about that?

FO: I could have, but I usually don't say anything as a co-pilot unless I think I'm in dire danger.

IP: What would you have said if the FO had said, 'I don't feel ready?'

CA: I would have said, 'Let's take another turn in holding then.'

Reinforcing the Utilization of CRM through Crew Interaction

Instructors and crews too often fall into a pattern of discussion that centers entirely on the instructor: the instructor asks a question, a crew member responds, the instructor comments, and the cycle repeats. The crew will benefit in several ways, however, if you can get them to discuss their performance in the LOS directly with each other. Interactive discussion between crew members during the debriefing allows them to practice CRM skills such as communication and problem solving. It also leads them toward the ultimate goal of being able to debrief themselves in line operations. You can counter the crew members' natural tendency to direct their comments to you by using the following techniques.

- Ask crew members to discuss how they were affected by each other's actions.

It is important that crew members understand how their actions effect each other. By openly discussing these issues, crew members may become more aware of the impact of their actions and the importance of communicating what they are doing and why.

Effective:

IP: When he was going through the checklist he said, 'It's in the other checklist.' Did you know what he meant? Talk about that.

CA: I knew what you meant, but I just kept thinking 'Are we on the right checklist?'

FE: I knew we were on the right checklist, it's just that the two are somewhat redundant. But I figured as long as we got all of the items done. But I should have said something to you.

CA: Okay. I guess I know that now, but I didn't at the time.

Effective:

IP: You guys were very supportive in there. What did the captain do to help create that environment?

FO: Well, he set the tone right off the bat during the briefing, telling us that if we had anything at all to say, we should speak up. So that made it a lot easier to say what was on my mind when I needed to.

- Ask crew members to discuss what they were each thinking.

Encouraging crew members to openly articulate and discuss what they were thinking may help them understand each other's point of view and thereby enhance communication.

Effective:

IP: CA, what did you do after you called for the engine fire checklist?

CA: I got on the radio to talk to ATC.

IP: And what did you think about that, FO?

FO: I couldn't believe you were talking to them. I thought we should have at least had the first couple of items on the checklist attacked by then.

CA: And see, my initial gut feeling was, 'Get this thing headed for Boston now, whether you get the fire out or not, we need to be heading that way.'

IP: Why do you think that CA?

A: Analysis and Evaluation of LOS Performance

For crew members to learn from their LOS experience, it is essential that they analyze and evaluate what happened. Crews should analyze both what went well during their LOS and what did not work as well. The analysis must go beyond simply naming the strong and weak points of their performance. Crews can gain powerful insight by analyzing why things turned out the way they did, including factors that either enabled or hindered their success. Remember to refrain from giving your analysis until the crew have completed theirs.

Getting Crews to Evaluate their Performance

It is important for crews to learn to critically evaluate their own performance in the LOS so they can carry this skill over into line operations. As the crew discusses the LOS, you may find it helpful to use a wallboard to list "strengths" and "areas for improvement" as they are identified by the crew. The following techniques may be useful in encouraging crews to evaluate their performance in depth.

- Get the crew to talk about what went well.

Discussing what they did well helps the crew to recognize what strategies were effective in managing the LOS challenges and how these strategies might be used in line situations. This is also a good strategy to use when crews say everything went great during the LOS, so they can actively identify exactly what went well and why.

Effective:

IP: FO, talk about one thing that went really well for you on that first leg.

FO: I think the fact that I didn't get overloaded at any time, that I was able to stay ahead of the airplane, and because of that the rest of the leg went pretty smoothly.

Ineffective:

IP: You did a good job on that. Did you know you did a good job on that?

FO: No.

IP: Well, you did.

Effective:

- "What aspects of your performance were particularly strong on the first leg of your LOS flight?"

- “What did you like about your performance on this trip?”

- Get the crew to talk about what could be improved, and how.

Discussing what did not go well helps the crew identify problems that occurred, examine why they occurred, and determine how to resolve or avoid similar problems in the future.

Effective:

IP: What happened on your preparation for the approach? Would you have done anything differently?

FO: Well, I dropped the ball by not putting the approach in there. I don't know where I was when that was happening.

CA: Well, yeah, and I didn't pick up on that either. We both missed it.

Effective:

IP: What did you think about your go around?

CA: I was coming down and I just hit vertical speed and then max power and then flaps 15. I was trying to be smooth, but I thought it was really poor, actually.

Effective:

- “Are you satisfied with how you handled the generator failure? Why or why not?”
- “Discuss one thing that you would like to have handled better during your climb out.”
- “Why did the miscue occur, and what situation led to both of you missing it?”
- “What events led to SOPs not being adhered to?”

- Troubleshooting: When the crew says everything went great.

If, when asked to evaluate their performance, the crew members say everything went great, facilitation may be required to encourage the crew to analyze and evaluate in more depth. If everything did go well in the LOS, encourage the crew members to discuss specific instances of good performance and analyze why they went as well as they did. Also, encourage them to discuss how they could have handled situations if they had not gone so well. If there were, in fact, situations that were not handled effectively, draw the crew's attention to a specific situation and ask if there is another way it could have been handled. Regardless of whether or not everything went smoothly in the LOS, it is important that the crew members understand both the factors that led to their successes and the factors that led to weaker aspects of their performance.

Eliciting Deep Analysis

To learn deeply from the LOS experience and take the lessons learned back to the line, crew members need insight into why

events in the LOS turned out the way they did. Crew members can gain this insight through in-depth analysis of their LOS performance. You can help the crew analyze in depth by asking questions that require careful thought and detailed responses.

- Ask questions that require description and analysis of LOS events.

Open questions that require descriptive or analytical responses lead crew members to explore issues more thoroughly, which opens the door for deeper learning.

Effective:

- “Describe what happened there and why it happened the way it did.”
- “What did you notice while watching that video segment of your LOS session?”
- “Tell me what you did to handle that situation.”
- “If you had to report to the safety people about this incident, how would you describe the situation and how you handled it?”

Ineffective:

Questions beginning with “Did you” or “Do you think” enable simple responses, and thus do not promote in-depth analysis.

- “Did you follow the correct checklist for that problem?”
- “Do you think you handled that situation effectively?”

- Get the crew to analyze why they made the decisions they made.

Articulating why they did what they did helps crew members gain insight into their decision-making processes, as well as the factors that influenced, or should have influenced, their decision-making.

Effective:

IP: The RVR was down below twenty-four hundred, but you asked for two-twenty on the speed, and I was wondering why.

CA: Well, the jet stream was real low, and there was all kinds of weather, with a warm front coming through, so I'm thinking that if we're going to be hanging close, we need to be clean maneuvering, so let's add a couple initially to make it smooth but still slow it down.

Effective:

IP: Why did you turn off the pitot heat?

CA: Because I looked at the outside air temperature and it was plus fifteen C, so I figured we were good with that.

Effective:

IP: Why did you decide to go back to Minneapolis instead of continuing on to Chicago? What was your thought process?

CA: Well, I was thinking that we were still a lot closer to Minneapolis than Chicago. Then again I also knew the weather was not as good in Minneapolis as it was in Chicago, so if that sick passenger were stable in the back, I was all for going on to Chicago. But as he started to deteriorate rapidly, I thought the best course of action would be to turn around and go back because I thought the guy might die if I didn't get him back pretty quick.

Effective:

- "Why did you feel it was necessary to disregard ATC until you completed your checklist?"
- "What made you decide to verify the information you received from ATC?"

When you analyze for the crew it leaves little for them to say. It also gives them the message that you are teaching them so they are not expected to analyze for themselves.

Ineffective:

"The reason you got into trouble during the approach is that you didn't communicate to the CA that you were unsure of the clearance."

- Get crew members to discuss what they were thinking.

Getting the crew to discuss what they were thinking during the LOS can help them discover what information and events influenced their actions.

Effective:

IP: What was going through your mind at that moment?

CA: Well, I was thinking about the sick lady in the back and that we had to get down and get her to a doctor; but you can't rush the approach because we might have to make a missed approach and then it would take even longer.

Effective:

- "What were you thinking when you received the traffic alert?"
- Encourage the crew to discuss the factors that enabled or impeded their success.

Identifying underlying factors that enabled or impeded their success in the LOS can help the crew members recognize similar factors when they occur on the line.

Effective:

IP: CA, was there something that helped make that windshear recovery go so well?

CA: Yes, FO was very assertively making speed callouts all the way that helped me stay on target.

Effective:

IP: CA, can you think of any factors that contributed to your getting rushed on that approach?

CA: Well, in hindsight, I should never have accepted the turn onto base leg before we had finished the abnormal checklist.

FO: I wasn't sure if you realized we had not finished it. I wish I had queried you on that.

L: Line Operations — Applying Lessons from LOS

To help crew members transfer the lessons they learn in the LOS to the line, encourage them to discuss how LOS performance and associated CRM issues relate to effective line operations.

Get the Crew to Discuss Related Line Incidents

Getting the crew members to discuss actual line incidents and accidents related to CRM issues that arose during the LOS can help them to appreciate the role of CRM in line operations. For example, if a crew communicated well during the LOS which resulted in a positive outcome, the importance of their effective communication can be reinforced by having them discuss a line accident that resulted from poor communication.

Effective:

IP: Looking back on the [XXX] accident we had where the guys taxied onto the wrong runway, what was the major problem there?

CA: Lack of communication. And not paying attention. When you're taxiing under conditions like that both guys better keep their heads where they should be. They should be thinking about nothing but taxiing.

Get the Crew to Discuss How to Apply Their Success to Line Operations

The next step in getting the crew members to transfer what they learn in the LOS to line operations is to get them to explore how they can apply techniques they utilized successfully in the LOS to overcome obstacles on the line. Getting crew members to talk about how they would handle difficult situations enables them to develop effective, pre-planned strategies for dealing with real situations when they occur on the line. For example, one crew's success in a particular LOS might have been aided by the fact that both crew members were good at explicit sharing of appropriate information. In the debriefing, you might find it useful to facilitate a discussion of how to deal with crew members on the line who are not as good at sharing information.

Effective:

- "What would you do if you ran into one of those guys on the line?"
- "How would you handle the same situation if the CA/FO/FE were completely non-communicative?"

- “In what other situations could you use that technique?”

Get Crew to Discuss What They Would do Differently

Discussing what they would do differently enables crew members to develop strategies they can use to make more effective decisions and to avoid similar incidents in line operations. Ideally, crew members should discuss the strategies they can use to turn each item in their *areas for improvement* list into *strengths*. It is often useful to frame this discussion in terms of how the crew members can handle similar situations if they occur on the line.

Effective:

- IP: CA, tell me what you could have done to make the approach onto runway three- two work out better than it did.
- CA: I could have just immediately gone to the approach page and put in runway three-two, brought it up and it would have probably had Grunds. Even if it hadn't, it would have had everything else we needed, and things would have gone a lot more smoothly.

Ineffective:

- IP: You could have avoided that by using your FO more effectively.

[Telling the crew what they should have done differently denies them the opportunity to figure it out for themselves.]

Effective:

- “What CRM techniques can you use to keep from getting overloaded in the future?”
- “How will you manage that situation if it comes up tomorrow on the line?”

Get the Crew to Discuss How They Will Do Things Differently on the Line Based on Their Experience in the LOS

This final step requires crews to specifically tie what they have learned in the debriefing to the line. Having crews discuss how they will perform differently based on what they have learned can help them make the connection necessary to transfer thoughts into actions.

Effective:

- “What would you do differently back on the line to avoid the problems that occurred during the second leg?”
- “Let's say you're flying into LAX tomorrow, and ATC switches the runway on you at the last minute. What CRM techniques can you use to manage the situation?”♦

Appendix A

Guidelines for Facilitating LOS Debriefings

Facilitation Basics

- ✓ Keep the discussion crew-centered.
- ✓ Encourage crew members to participate actively and do most of the talking.
- ✓ Adapt the level of facilitation you use to the capabilities of each crew.
- ✓ Balance your dual role as instructor and facilitator.
- ✓ Reinforce good crew performance following crew analysis.
- ✓ Show by your attitude that you are interested in what the crew members have to say.
- ✓ Don't lecture or make long speeches.
- ✓ Don't interrupt or leave a topic while the crew still has something to say.
- ✓ Use the highest level of facilitation possible to maximize crew self-discovery.
- ✓ Adapt the level of facilitation to accommodate varying crew needs throughout the session.

The Introduction

- ✓ Clarify your role as the instructor and detail your expectations for crew participation.
- ✓ Provide a persuasive rationale for why the debriefing should be crew-centered.
- ✓ Tell the crew how long the session will last.
- ✓ Don't cut sessions short for high-performing crews.

Agenda and Format

- ✓ Explain the format the debriefing will follow.
- ✓ Help the crew develop an agenda.
- ✓ Ensure that all critical issues are covered.
- ✓ Use the C-A-L Model as a framework for discussion of each topic.

Facilitation Techniques

- ✓ Use questions to promote in-depth crew participation.
- ✓ Follow up on crew topics and redirect crew questions and comments back to them.
- ✓ Ask questions that begin with *what*, *how*, and *why* to encourage deeper discussion.
- ✓ Encourage crew members to discover their own answers.
- ✓ Make sure all crew members are fully drawn into the discussion.
- ✓ Direct questions to quiet crew members.
- ✓ Ask quiet crew members to comment on what other crew members said.
- ✓ Avoid unwittingly hindering crew participation.
- ✓ Don't answer for the crew when they don't immediately respond to your question.
- ✓ Re-word questions rather than giving the answer.
- ✓ Use active listening to encourage continued participation.
- ✓ Use silence/pauses to elicit thoughtful crew responses.

Use of Video

- ✓ Index important events during the LOS.
- ✓ Don't show video segments you don't intend to discuss.
- ✓ Learn how to use the video equipment efficiently.
- ✓ Introduce each video segment and remind the crew that they will analyze what they see.
- ✓ Pause the video for comments and to discuss important aspects of crew performance.

Guidelines for Facilitating LOS Debriefings (continued)

Reinforcing CRM through Crew Interaction

- ✓ Encourage crew members to address each other directly.
- ✓ Ask crew members to discuss how they were affected by each other's actions.
- ✓ Encourage crew to discuss what they were each thinking.

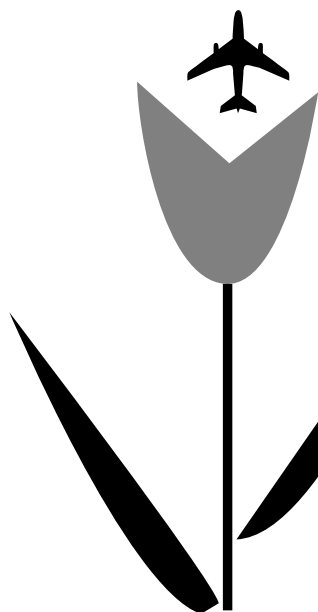
Eliciting in-depth Analysis and Evaluation

- ✓ Don't give your analysis or evaluation before crew have completed theirs.
- ✓ Get crew to talk about what went well.
- ✓ Get crew to talk about what could be improved, and how.
- ✓ Encourage crew to discuss how they might have handled things if they had not gone so well.
- ✓ Push the crew to go beyond just describing what happened.
- ✓ Ask follow-up questions that require in-depth analysis.
- ✓ Ask crew to analyze *why* they made the decisions they made.
- ✓ Get crew to discuss what they were thinking.
- ✓ Encourage the crew to discuss the factors that enabled or impeded their success.
- ✓ Have the crew discuss how they can apply what they learned in the LOS during line operations.

Summary

- ✓ *Briefly* summarize the debrief: Reiterate important issues and tie LOS events to line operations.

BLANK
INSIDE
BACK
COVER



Managing Aviation Safety

bAck to BasiCs

Amsterdam, Netherlands



10th annual European Aviation Safety Seminar (EASS)



Flight Safety Foundation

March 16-18, 1998

For information contact:

Steve Jones, director of membership

601 Madison Street, Suite 300, Alexandria, VA 22314 U.S. Telephone (703) 739-6700, extension 106; Fax: (703) 739-6708

Visit our World Wide Web site at <http://www.flightsafety.org>

FLIGHT SAFETY DIGEST

Copyright © 1997 FLIGHT SAFETY FOUNDATION INC. ISSN 1057-5588

Suggestions and opinions expressed in FSF publications belong to the author(s) and are not necessarily endorsed by Flight Safety Foundation. Content is not intended to take the place of information in company policy handbooks and equipment manuals, or to supersede government regulations.

Staff: Roger Rozelle, director of publications; Rick Darby, senior editor; Daniel P. Warsley, senior editor/writer; Joy Smith, editorial assistant; Todd Lofton, editorial consultant; Karen K. Ehrlich, production coordinator; Ann L. Mullikin, assistant production coordinator; and David A. Grzelecki, librarian, Jerry Lederer Aviation Safety Library.

Subscriptions: US\$95 (U.S.-Canada-Mexico), US\$100 Air Mail (all other countries), twelve issues yearly. • Include old and new addresses when requesting address change. • Flight Safety Foundation, 601 Madison Street, Suite 300, Alexandria, VA 22314 U.S. • Telephone: (703) 739-6700 • Fax: (703) 739-6708

We Encourage Reprints

Articles in this publication may be reprinted in whole or in part, but credit must be given to: Flight Safety Foundation, *Flight Safety Digest*, the specific article and the author. Please send two copies of reprinted material to the director of publications.

What's Your Input?

In keeping with FSF's independent and nonpartisan mission to disseminate objective safety information, Foundation publications solicit credible contributions that foster thought-provoking discussion of aviation safety issues. If you have an article proposal, a completed manuscript or a technical paper that may be appropriate for *Flight Safety Digest*, please contact the director of publications. Reasonable care will be taken in handling a manuscript, but Flight Safety Foundation assumes no responsibility for material submitted. The publications staff reserves the right to edit all published submissions. The Foundation buys all rights to manuscripts and payment is made to authors upon publication. Contact the Publications Department for more information.